THE DREAMS OF THE BLIND.

(by Joseph ~~Jastron)~~
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# THE DREAMS OF THE BLIND.

MAN is a visual animal. To him "seeing is believing"—a saying which we can imagine a dog translating into "smelling is believing." We teach by illustrations, models, and object-lessons, and reduce complex relations to the curves of the graphic method to bring home and impress our statements. Our every-day language, as well as the imagery of poetry, abounds in metaphors and similes appealing to images which the eye has taught us to appreciate. One grand division of art is lost to those who cannot see. The eye is the centre of emotional expression, and reveals to our fellow-men the subtile variations in mood and passion, as it is to the physician a delicate index of our well-being. There are reasons for believing that it was the function of sight as a distance-sense that led to its supremacy in the lives of our primitive ancestors. Whatever its origin, the growth of civilization has served to develop this "eye-mindedness" of the race and to increase and diversify the modes of its cultivation.

The eye, thus constantly stimulated in waking life, and attracting to its sensations the focus of attention (possessing, as it does, in the retinal fovea a most powerful instrument of concentrative attention), does not yield up its supremacy in the world of dreams. The sight-centres subside but slowly from their long stimulation, and the rich stock of images which these centres have stored up is completely at the service of the fanciful imagination of dream-life. In fact, we speak of a dream as a "vision."

Though as a race we are eye-minded, individually we differ much with regard to the rôle that sight plays in our psychic life. Under one aspect a good index of its importance is to be found in the perfection of the visualizing faculty, of which Mr. Galton has given an interesting account. Mr. Galton * (whose results have received a valuable verification at the hands of Doctors McCosh † and Osborn) asked various persons to describe, amongst other things, the vividness of their mental picture when calling to mind the morning's

* Francis Galton: *Inquiries into Human Faculty*, pp. 83 *sq.*
† James McCosh: *The Cognitive Powers*, pp. 105, 106.

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breakfast-table. To some the mental scene was as clear and as natural as reality, lacking none of the details of form or color; to others the resulting mental image was tolerably distinct, with the prevailing features well brought out, but the rest dim and vague; while a third group could only piece together a very vague, fragmentary, and unreliable series of images, with no distinct or constant picture.

Similar differences can be observed with regard to memories,* some persons firmly retaining what they read, while the memory-forte of others is in what they hear: and pathology supports this subdivision of the sense-memories by showing, for example, that all remembrance for seen objects may be lost while that for sounds remains intact. A case remarkable in several aspects is recorded by M. Charcot.† The gentleman in question could accurately call up in full detail all the scenes of his many travels, could repeat pages of his favorite authors from the mental picture of the printed page, and could add long columns of numbers in the same way. The mere mention of a scene in a play or of a conversation with a friend immediately brought up a vivid picture of the entire circumstance. Through nervous prostration he lost this visual memory. An attempt to sketch a familiar scene now resulted in a childish scrawl; he remembered little of his correspondence, forgot the appearance of his wife and friends, and even failed to recognize his own image in a mirror. Yet his eyesight was intact and his intellect unimpaired. In order to remember things he had now to have them read aloud to him, and thus bring into play his undisturbed auditory centre—to him an almost new experience.

The function of vision in dreams is doubtless subject to similar individual variations, though probably to a less extent. Seeing is,

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* M. Binet, *Psychologie du Raisonnement*, pp. 16–32, proposes a classification of mental types according to the predominating sense-images. There is the "visual type" of mind, in which the sight-centres assimilate most of the mental acquisitions; examples of this are the chess-players who play blindfolded, the orators who "see" the words in their manuscript as they speak, the artists who paint portraits from memory, and the like. There is an "indifferent type," to which all the avenues of sense are almost equally attractive and important. Again, there is the "auditory type"; represented by those who must calculate out loud; those who, in describing a scene, imagine themselves of the "audience" and not of the "spectators"; by Blind Tom, playing a musical selection after a single hearing, and Beethoven, composing symphonies after his deafness. Finally, there is the "motor type" of mind, predominant in those to whom the muscle-feelings accompanying action form the central bond of memory. Actors are, perhaps, likely to develop this last kind of memory.

† Cited by Binet, op. cit., pp. 21–25: also by Dr. H. Wilbrand: *Die Seelenblindheit* (1887), pp. 43–51.

with rare exceptions, the typical operation in dreams; it is this sense, too, that is most readily stimulated into morbid action under the influence of drugs or other excitement, and most easily made the basis of delusions and hallucinations in a disordered mind. The dependence of the nature and content of dreams upon the waking experiences is so clearly proven that it would be surprising not to find in them individual characteristics of mind, especially if Aristotle is right in saying that in waking life we all have a world in common, but in dreams each has a world of his own.

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With regard to the blind much of what has been said above is entirely irrelevant. However intimately we appreciate the function of sight in our own mental development, it is almost impossible to imagine how different our life would have been, had we never seen. But here, at the outset, a fundamental distinction must be drawn between those blind from birth or early infancy and those who lose their sight in youth or adult life.* "It is better to have seen and lost one's sight than never to have seen at all," is quite as true as the sentiment which this form of statement parodies. Expressed physiologically, this means that to have begun the general brain-building process with the aid of the eye insures some further self-development of the visual centre, and thus makes possible a kind of mental possession of which those born blind are inevitably deprived.†

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* A noted blind teacher of the blind says: "Wenn wir . . . den Einfluss der Blindheit auf die geistige Thätigkeit des Blinden beobachten, so haben wir Blindgeborene und Blindgewordene . . . streng auseinander zu halten."

† This applies mainly to intellectual acquirements. The emotional life of those who have lost their sight is often, and with much truth, regarded as sadder and more dreary than that of the congenitally blind; the former regretfully appreciate what they have lost: the latter live in a different and more meagre world, but have never known any other. It is interesting in this connection to trace the influence of the age of "blinding" (*sit venia verbo*) on the mental development of eminent blind men and women. Of a list of 125 blind persons of very various degrees of talent, which I have been able to collect, the age of blinding was (approximately) ascertainable in 114 cases. Of these about 11 are really very distinguished, and 10 of them (the exception is the wonderful mathematician, Nicholas Saunderson) became blind either in advanced youth, middle life, or still later; of the group next in eminence (about 25) the average age of the onset of blindness is in early youth, at nine or ten years, and those earliest blind are generally musicians, who least of all require sight for their calling; the average age of blinding of the rest of the list—whose achievements would for the most part not have been recorded had they not been those of blind persons—is as low as seven years, while that of the musicians (about 15 in the group) is little over three years. All this speaks strongly for the permanent intellectual importance of sight in early education.

A fact of prime importance regarding the development of the sight-centre is the age at which its education is sufficiently completed to enable it to continue its function without further object-lessons on the part of the retina. If we accept as the test of the independent existence of the sight-centre its automatic excitation in dreams, the question can be answered by determining the age of the onset of blindness which divides those who still retain in their dreams the images derived from the world of sight, from those who do not. The data that enable me to answer this question were gathered at the Institutions for the Blind in Philadelphia and Baltimore; and I desire to express my gratitude to the authorities and teachers of these Institutions for the courtesy and privileges extended to me in my research. Nearly 200 persons of both sexes were personally examined, and their answers to quite a long series of questions recorded. All dates and ages were verified by the register of the institution, and the degree of sight was tested.

Beginning with cases of total blindness (including under this head those upon whom light has simply a general subjective "heat-effect," enabling them to distinguish between night and day, between shade and sunshine, but inducing little or no tendency to project the cause of the sensation into the external world), I find on my list fifty-eight such cases. Of these, thirty-two became blind before completing their fifth year, and *not one* of these thirty-two sees in dreams. Six became blind between the fifth and the seventh year; of these, four have dreams of seeing, but two of them do so seldom and with some vagueness, while two never dream of seeing at all. Of twenty persons who became blind after their seventh year *all* have "dream-vision"—as I shall term the faculty of seeing in dreams. *The period from the fifth to the seventh year is thus marked out as the critical one.* Before this age the visual centre is undergoing its elementary education; its life is closely dependent upon the constant food-supply of sensations, and when these are cut off by blindness it degenerates and decays. If blindness occurs between the fifth and the seventh years, the preservation of the visualizing power depends on the degree of development of the individual. If the faculty is retained, it is neither stable nor pronounced. If sight is lost after the seventh year, the sight-centre can, in spite of the loss, maintain its function, and the dreams of such an individual are hardly distinguishable from those of a seeing person.

I had already entered upon this research when I discovered that

I had a predecessor. So long ago as 1838 Dr. G. Heermann * studied the dreams of the blind with the view of determining this same question, the physiological significance of which, however, was not then clearly understood. He records the answers of fourteen totally blind persons who lost their sight previous to their fifth year, and *none* of these have dream-vision. Of four who lost their sight between the fifth and the seventh year one has dream-vision, one has it dim and rare, and two do not definitely know. Of thirty-five who became blind after their seventh year *all* have dream-vision. The two independent researches thus yield the very same conclusion. Doctor Heermann includes in his list many aged persons, and from their answers is able to conclude that, generally speaking, those who become blind in mature life retain the power of dream-vision longer than those who become blind nearer the critical age of five to seven years. He records twelve cases where dream-vision still continues after a blindness of from ten to fifteen years, four of from fifteen to twenty years, four of from twenty to twenty-five years, and one of thirty-five years. In one case dream-vision was maintained for fifty-two, and in another for fifty-four years, but then faded out.†

With regard to the partially blind, the question most analogous to the persistence of dream-vision after total blindness is whether or not the dream-vision is brighter and clearer than that of waking life; whether the sight-centre maintains the full normal power to which it was educated, or whether the partial loss of sight has essentially altered and replaced it. To this rather difficult question I have fewer and less satisfactory answers than to the former inquiry, but the evidence is perfectly in accord with my previous conclusions. Of twenty-three who describe their dream-vision as *only as clear* as wak-

* "Beobachtungen und Betrachtungen über die Träume der Blinden, ein Beitrag zur Physiologie und Psychologie der Sinne" (in *Monatsschrift für Medecin, Augenheilkunde, &c., von Dr. Ammon.* I., pp. 116–180. Leipzig, 1838), an excellent article, written in a spirit in advance of that of his day, and extremely valuable and suggestive. He records 101 cases, and on the few points where it was possible, I have either incorporated his answers in mine or corroborated mine by his. I owe much to this article. I also found two other articles on this topic by teachers of the blind—one by Mr. Johns (*National Review*, May, 1885), the other in a rare tract by Friedrich Scherer—neither of much value for me.

† Doctor Heermann's observations also enable us to trace the anatomical conditions underlying the power of dream-vision. From ten cases in which post-mortem examinations were held, he concludes that, allowing for much individual difference, after about twenty years the optic nerves degenerate, and often as far back as the chiasma. This shows that the nerve is not necessary for dream-vision, and thus goes to prove that the process is dependent on cerebral organs—a valuable piece of evidence fifty years ago. Esquirol records a case of sight-hallucinations in a blind woman, again indicating the same conclusion.

ing sight, *all* became blind *not later than* the close of their *fifth year;* while of twenty-four whose dream-vision is more or less markedly clearer than their partial sight, *all* lost their full sight *not earlier* than their *sixth year.** The age that marks off those to whom total blindness carries with it the loss of dream-vision from those whose dream-vision continues, is thus the age at which the sight-centre has reached a sufficient stage of development to enable it to maintain its full function when partially or totally deprived of retinal stimulation. The same age is also assigned by some authorities as the limiting age at which deafness will cause muteness (unless special pains be taken to prevent it), while later the vocal organs, though trained to action by the ear, can perform their duties without the teacher's aid. This, too, is assigned as the earliest age at which we have a remembrance of ourselves. This last statement I can directly test by one hundred answers which I have to the question, "What is your earliest remembrance of yourself?" The average age to which these memories go back is 5.2 years, seventy-nine instances being included between the third and the sixth years. At this period of child development—the centre of which is at about the close of the fifth year—there seems to be a general "declaration of independence" of the sense-centres from their food-supply of sensations. Mr. Sully † finds sense, imagination, and abstraction to be the order in which the precocity of great men reveals itself, and the critical period which we are now considering seems to mark the point at which imagination (and abstraction) can come into play. M. Perez ‡ likewise recognizes the distinctive character of this era of childhood by making the second part of his "infant psychology" embrace the period from the third to the seventh year.

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* A further interesting question regarding the dream-vision of the partially blind is, how much must they see in order to dream of seeing? In answering this question the blind give the name "seeing" to what is really a complex of sensations and judgments, and this same complex may enter into their dreams. Cases occur in which there is only the slightest remnant of sight, and yet this forms a factor in dream life. It is a very imperfect kind of vision, and acts more as a general illumination and anticipatory sense. Generally speaking, those who know color have more frequent and brighter dream-vision than those who distinguish light and shade only. For example, of those partially blind from birth, such as see color tolerably well (there are sixteen such) have regular dream-vision, of course, no clearer than their best days of sight. Of eleven who have some faint notion of color three have dream-vision regularly, six have it rarely, while two (almost never or) never have it. Of eleven who can see no color at all ten have no dream-vision, and one has it occasionally.

† James Sully: "Genius and Precocity." *Nineteenth Century*, June, 1886.

‡ *La Psychologie de l'Enfant: L'Enfant de Trois a Sept Ans.* Par Bernard Perez. Preface.

This general fact, that the mode in which a brain-centre will function depends so largely on its rudimentary education, but that, this education once completed, it can maintain its function, though deprived of sense-stimulation, is sufficiently important to merit further illustration.* The fact, though very clear and evident when stated from a modern point of view, was not always recognized. So ingenious a thinker as Erasmus Darwin inferred from two cases, the one of a blind man, the other of a deaf-mute, in which the wanting senses were also absent in their dreams, that the peripheral sense-organ was necessary for all "perception," subjective as well as objective, entirely neglecting the age at which the sense was lost. Such noted physiologists as Reil, Rudolphi, Wardrop ("when an organ of sense is totally destroyed, the ideas which were received by that organ seem to perish along with it as well as the power of perception"), Hartman, more or less distinctly favored this view; while some teachers of the blind, and the physiologists Nasse and Autentreith rightly drew the distinction between those born, and those who became, blind. An experimental demonstration of the original dependence of the perceptive and emotional powers upon sense-impressions was furnished by Boffi and Schiff, who found that young dogs the olfactory bulbs of which were removed failed to develop any affection for man.

What is true of the visual is doubtless equally true of the other perceptive centres. The dreams of the deaf-mute offer an attractive and untouched field for study. The few accounts of such dreams that I have met with fail to give the age at which deafness set in; in one case, however, in which deafness occurred at thirty years, the pantomimic language had replaced the spoken in the dreams of thirty years later. Similarly, cripples dream of their lost limbs for many years after their loss, though here stimulation of the

* That even a comparatively slight disturbance of vision, affecting only a small portion of the visual experience, can leave a permanent trace upon the sight-centre is made very probable by a most valuable case recorded by Doctor McCosh, *Cognitive Powers*, p. 106. A young man was suffering from seeing everything double, a defect which a subsequent operation removed. "If I attempt," he writes, "to recall scenes that I saw while my eyes were out of order, I invariably see them as they appeared during that time, although I may have seen them many times since the operation. For instance, in the case of the minister in the pulpit at home, I see two images of him, no matter how much I may try to get rid of one of them. . . . My recollection of the office in which the operation was performed, as also of everything in it, is double, although I saw it only twice before the restoration of my sight, and many times after. The objects which I have seen since the operation are always single when recalled."

cut nerves may in some cases be the suggestive cause of such dreams. A man of forty, who lost his right arm seventeen years ago, dreams of having the arm. The earliest age of losing and dreaming about a lost limb, of which I can find a record, is of a boy of thirteen years who lost a leg at the age of ten; this boy still dreams of walking on his feet. Those who are born cripples must necessarily have these defects represented in their dream consciousness. Heermann cites the case of a man born without hands, forearms, feet, or lower legs. He always dreams of walking on his knees, and all the peculiarities of his movements are present in dream-life.

The dreams of those both blind and deaf are especially instructive in this regard. The name of Laura Bridgman at once suggests itself; many of her dreams have been recorded, and an unpublished manuscript by Prof. G. Stanley Hall places at my service a very full account of her sleep and dreams. Sight and hearing are as absent from her dreams as they are from the dark and silent world which alone she knows. The tactual-motor sensations, by which she communicates with her fellow-beings, and through which almost all her intellectual food is brought, are also her mainstay in dreams. This accounts for the suddenness and fright with which she often wakes from her dreams; she is perchance dreaming of an animal which to us would first make itself seen or heard, but to her is present only when it touches and startles her. She lacks the anticipatory sense. Language has become so all-important a factor in civilized life that it naturally is frequently represented in dreams. We not only dream of speaking and being spoken to, but we actually innervate the appropriate muscles and talk in our sleep. This Laura Bridgman also does. "Her sleep seemed almost never undisturbed by dreams. Again and again she would suddenly talk a few words or letters with her fingers, too rapidly and too imperfectly to be intelligible (just as other people utter incoherent words and inarticulate sounds in sleep), but apparently never making a sentence." * So, too, all the people who enter into

* From Professor Hall's manuscript. Professor Hall had the opportunity of observing her during three short naps, and has incorporated a part of his manuscript into a paper on Laura Bridgman, republished in his *Aspects of German Culture*, pp. 268–270. From this manuscript I take the following illustrations of her dreams, and her method of describing them. They are recorded verbatim.

"*Question.* 'Do you dream often?' *Answer.* 'Very often, many things.' *Q.* 'Did you think hard yesterday to remember dreams for me?' *A.* 'I did try, but I always forget very soon.' *Q.* 'Did you ever dream to hear?' [Her idiom for 'that you could hear.'] *A.* 'Only the angels playing in heaven.'

her dreams talk with their fingers. This habit had already presented itself at the age of twelve, four years after her first lesson in the alphabet. "I do not dream to talk with mouth; I dream to talk with fingers." No prettier illustration could be given of the way in which her fancy builds upon her real experiences, than the fact recorded by Charles Dickens, that on picking up her doll he found across its eyes a green band such as she herself wore. The organic sensations originating in the viscera, though often prominently represented in dreams of normal persons, seem especially prominent in her dreams. She often tells of feeling her blood rush about, and of her heart beating fast when suddenly waking, much frightened, from a distressing dream. One such dream she describes as "hard, heavy, and thick"; terms which, though to us glaringly inappropriate in reference to so fairy-like a structure as a dream, form an accurate description in the language of her own realistic senses. In short, her dreams are accurately modelled upon the experiences of her waking life, reproducing in detail all the peculiarities of thought and action which a phenomenal education has impressed upon her curious mind.

I have had the opportunity of questioning a blind deaf-mute, whose life-history offers a striking contrast to that of Laura Bridgman, and illustrates with all the force of an experimental demonstration the critical educational importance of the early years of life. The young man in question is now twenty-three years of age, earns a comfortable living as a broom-maker, has an active interest

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*Q.* 'How did it sound?' *A.* 'Very beautiful.' *Q.* 'Like what?' *A.* 'Nothing.' *Q.* 'Was it loud?' *A.* 'Yes, very.' *Q.* 'What instruments?' *A.* 'Piano.' *Q.* 'How did the angels look?' *A.* 'Beautiful.' *Q.* 'Had they wings?' *A.* 'I could not know.' *Q.* 'Were they men or women?' *A.* 'Don't know.' *Q.* 'Can you describe their dress?' *A.* 'No.' *Q.* 'Was the music fast or slow?' *A.* 'I cannot tell.' On another occasion she was asked, 'Did you ever dream to see?' *A.* 'I could see the sun.' *Q.* 'How did it look?' *A.* 'Glorious.' *Q.* 'What color?' *A.* 'I cannot tell' [with a sign of great impatience]. *Q.* 'Was it very bright?' *A.* 'Yes.' *Q.* 'Did it hurt your eyes?' *A.* 'Yes, they ached.' *Q.* 'What was it like?' *A.* 'Nothing. I saw it with my eyes' [much excited, breathing hard and fast, and pointing to her right eye]. Some days later, after some promptings from her attendants, she renewed the subject of her own accord, as follows: 'I remember once a dream. I was in a very large place. It was very glorious and full of people. My father and mother were standing by. The glorious piano was playing. When I heard the music I raised up my hand so' [standing and pointing impressively upward and forward with the index finger, as the letter g is made in the deaf and dumb alphabet] 'to my heavenly Father. I tried to say God.' *Q.* 'With your fingers?' *A.* 'Yes.' *Q.* 'Where was God?' *A.* 'So' [pointing as before]. *Q.* 'Far away?' *A.* 'No.' *Q.* 'Could you touch him?' *A.* 'No.' 'How did you know he was there?' *A.* 'I cannot tell.' *Q.* 'How did you know it was God?' *A.* 'I cannot explain.' *Q.* 'What was he like?' *A.* [After a pause] 'I cannot tell everything to everybody' [half playfully, whipping her right hand with her left, and touching her forehead significantly, to indicate that she was unable adequately to express what was in her mind]. *Q.* 'Could he touch you?' *A.* 'No. He is a spirit.' *Q.* 'Did he see you?' *A.* 'He sees everything. See how melancholy I look because I do not feel interested.' On another occasion she said, 'I often dream that Doctor Howe is alive and very sick,' but no details could be elicited. Again, after imitating the gait of different people, she said, 'I dream often of people walking. I dream many things, but do not remember what I really dream. I used to dream of animals running around the room, and it woke me.'"

It is evident that her dreams of hearing and seeing are either merely verbal, or the substitution and elaboration of kindred sensations (sense of jar and heat) which she experiences. For further examples of her dreams see her *Life and Education*, by Mrs. Lamson, pp. 88, 154, 166–168, 218, 223, 224, 226, 286, 290, 303, 304.

in the affairs of the world, and dislikes to be considered peculiar. His eyesight began to fail him in early childhood, and in his fifth year the sight of one eye was entirely lost, while that of the other was very poor. After a less gradual loss of hearing, he became completely deaf in his ninth year. At the age of twelve, when admitted to the institution for the blind at Baltimore, he was (practically) totally blind, deaf, and nearly mute. The small remnant of articulating power has been cultivated, and those who are accustomed to it can understand his spoken language. He also communicates as Laura Bridgman does, and has a further advantage over her in possessing a very acute sense of smell. He remembers the world of sight and hearing perfectly, and in a little sketch of his life which he wrote for me, vividly describes the sights and sounds of his play-days. He usually dreams of seeing and hearing, though the experiences of his present existence also enter into his dreams. Some of his dreams relate to flowers which he smelled and saw; he dreamt of being upset in a boat; shortly after his confirmation he dreamt of seeing God. When he dreams of making brooms his dream is entirely in terms of motion and feeling, not of sight. His history thus strongly emphasizes the importance which M. Perez attributes to the period of childhood from the third to the seventh years.

Before returning to the characteristics of the dreams of the blind, I will here insert certain facts with regard to dreaming in general, which the statistical nature of my inquiry enables me to furnish, and which it would be valuable to see corroborated by a similar study upon the dreams of normal individuals.

We seldom, if ever, meet with a person who has never dreamed, although many dream very rarely indeed. Of the 183 answers to the question, "Do you dream?" the percentage of those who simply say "Yes" (*i. e.*, when I could get no further information) is 25.7; of those answering "No," is 1.1; "Seldom," 43.2; "Frequently," 22.4, and "Every night," 7.6. From a general impression and in the absence of further statistics for seeing persons, I would judge that the blind are, on the whole, not such good dreamers as the sighted, the latter probably including more "frequent" and less "occasional" dreamers than the former. With regard to sex, the gentler sex furnishes the better dreamers. While of the males 54.5 per cent. dream seldom, 19.2 per cent. frequently, and 7.1 per cent. every night, similar numbers for the females are 29.8, 26.2, and 8.3 per

cent., *i. e.*, the latter have more "frequent" and fewer "occasional" dreamers. This favors the view that it is the vividness of the emotional background elaborated by the imagination that furnishes the predominant characteristic and tendency to dreams; for it is in the development of just these qualities that women excel men; the same view is favored by the relation of the prevalence of dreams to age. In my tables there is a loss of the total amount of dreaming in passing from the period of five to nine years to that of from ten to fourteen years. A slighter decrease is noted in passing from the latter period to that of the next five years, and this very gradual decrease seems to continue from then on. Childhood, the period of the lively imagination and highly tinged emotional life, brings the richest harvest of dreams.*

It was noticed that the blind and deaf young man mentioned above, though seeing in his dreams, never thus saw the shop in which he worked. This suggests the question of the distinguishability of the pre-blindness from the post-blindness period, as represented in dream-imagery. It is easy to imagine that the more or less sudden loss of sight, the immersion in a strange and dark world, would for a time leave the individual living entirely upon the past. His remembered experiences are richer and more vivid (we are supposing his blindness to occur after childhood) than those he now has; he is learning a new language and translates everything back into the old. His dreams will naturally continue to be those of his seeing life. As his experiences in his new surroundings increase and the memory of the old begins to fade, the tendency of recent impressions to arise in the automatism of dreaming will bring the events of the post-blindness period as factors into his dreams. I find in my list only seven who do not have such dreams; and in these the blindness has been on the average of only 2.8 years stand-

* I can add a note on the frequently discussed question whether impressions derived from recent or distant experiences predominate in dreams. Of 113 answers, 42 make "recent" dreams more frequent, 27 speak in favor of "distant" dreams, while 22 dream equally of both, thus supporting the view that dreaming is largely the dying out (*Abklingen*) of recently stimulated centres. The function of taste and smell in dreams is variously estimated, though the statement is usually and truly made that they furnish the smallest item of dream life. 33 remember dreams of smelling or tasting, while 95 do not; and of the former many have such dreams rarely. They usually occur as part of that complex of sensations accompanying eating, probably of a favorite dish (cake, ice-cream, and fruit predominate in the answers before me). Often this is not really smelling or tasting to a great extent. Five persons mention smelling (usually of flowers) as more frequent than tasting, and five say the reverse.

ing (the average age of "blinding" of the seven is fifteen years), making it probable that the adaptation to the new environment has here been a slow one and that such dreams will occur later on. On the other hand, cases occur in which, after three, two, or even one year's blindness, when the persons so afflicted were young, events happening within that period have been dreamed of.*

Whether there is a difference in the vividness, or any other characteristic which sight would lend, in the dreams of events before and after blindness, is a question to which I could obtain few intelligent and satisfactory answers; but, as far as they go, the tendency of these replies is to show that when blindness ensues close upon the critical period of five to seven years of age, the power of vivid dream-vision is more exclusively limited to the events of the years of full sight, and, as Heermann pointed out, this power is often subject to a comparatively early decay. Similarly, I find that those who lose their sight near the critical age are not nearly so apt to retain color in their dream-vision as those who become blind later on. The average age of "blinding" of twenty-four persons who have colored dream-vision, is 16.6 years, including one case in which blindness set in as early as the seventh year. (All who see enough to see color, have colored dream-vision.)

I also asked those who became blind in youth, or later, whether they were in the habit of giving imaginary faces to the persons they met after their blindness, and whether they ever saw such in their dreams. Some answered in very vague terms, but several undoubtedly make good use of this power, probably somewhat on the same basis as we imagine the appearance of eminent men of whom we have read or heard, but whose features we have never seen. When we remember how erroneous such impressions often are, we can understand how it often misleads the blind. Such imaginary faces and scenes also enter into their dreams, but to a less extent than into those of the sighted. Doctor Kitto † quotes a letter from a

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* Heermann cites a case of a man of seventy who never dreamed of the hospital in which he had been living for eighteen years, and to which he was brought shortly after his blindness. This and other cases suggest that the more mature and settled the brain-tissue, the more difficult is it to impress upon it new conditions sufficiently deeply to have them appear in the automatic life of dreams.

† *The Lost Senses*, by John Kitto; a valuable book, unfortunately out of print. Doctor Kitto draws an ingenious inference from the sonnet addressed by Milton to his deceased (second) wife, whom he married after the onset of his blindness. From the lines, "I trust to have | Full sight of her in Heav'n without restraint," and "The face was veiled, yet to my fancied sight," etc., he argues that the poet was unable to imagine the face of his

musician who lost his sight when eighteen years old, but who retains a very strong visualizing power both in waking life and in dreams. The mention of a famous man, of a friend, or of a scene, always carries with it a visual picture, complete and vivid. Moreover, these images of his friends change as the friends grow old; and he feels himself intellectually in no way different from the seeing.

This leads naturally to the consideration of the power of the imagination in the blind. It is not difficult to understand that the blind are deprived of one powerful means of cultivating this faculty, that the eye is in one sense the organ of the ideal. Their knowledge is more realistic (*handgreiflich*), and so their dreams often lack all poetical characteristics, and are very commonplace. Ghosts, elves, fairies, monsters, and all the host of strange romance that commonly people dreams, are not nearly so well represented as in the dreams of the sighted. What is almost typical in the dreams of the latter is unusual in the dreams of the blind.* Many observe that such dreams grow rare as they outgrow their youth, which is probably also true of the sighted. When the blind dream of ghosts they either hear them, and that usually not until they are close at hand, or they are actually touched by them. A blind man, describing a dream in which his friend appeared to him, said: "Then I dreamt that he tried to frighten me, and make believe he was a ghost, by *pushing me down sideways*," etc. By some the ghost is heard only; it has a rough voice and its bones rattle; or it pursues the victim, humming and groaning as it runs.

Contrary to the opinions of some writers, I find hearing, and not the group of tactual-motor sensations, to be the chief sense with the blind, both in waking and in dreams. That hearing owes very much of this supremacy to its being the vehicle of conversation, goes without saying. Many of the blind dream almost exclusively in this sense, and it is quite generally spoken of as the most important. Even those who see a little often regard hearing as their most useful sense; those who see color, however, almost without exception claim for their partial sight an importance exceeding that of hearing. This seems to be due not to any peculiar attractiveness or importance in color of itself, but to the circumstance that this degree of sight makes possible a sufficiently clear perception of

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wife, which he had never really seen, and so saw the face veiled; but hoped in the future world to have "full sight of her without restraint."

* This is especially true of those early blind.

objects to cultivate the use of sight as a "distance" and a "formation" sense. Next in importance to hearing is the group of sensations accompanying motion. An important item in the dreams of the sighted is furnished by this complex of sensations, and the same is true of the blind; almost all remember such dreams, and some make this their most important avenue of sensation. Reading the raised type with the finger almost never occurs in dreams. The boys dream of playing, running, jumping, and so on; the men of broom-making, piano-tuning, teaching, and similar work; the girls of sewing, fancy work, household work, and the like, many having accompanying sensations of other senses.*

There is often ascribed to the blind a somewhat mystical sense, by which they can tell the presence and even the nature of objects, and can feel their way. As far as such a power exists it is nothing more than the cultivation of an "irradiation sense," which we all possess. It is not at all difficult to tell whether a large object is within a few inches of the hand, if its temperature is somewhat different from that of the room, or if it be an object like metal, which rapidly exchanges its heat. In sunlight the shadows of stones and posts can be thus detected; and the illumination of a room, both its source and extent, can be judged. This sense the blind carefully, though often unconsciously, cultivate, and I have heard it spoken of by them as "facial perception," because the face seems to be most sensitive to this kind of change. Many mention that the power fails them under the influence of a headache or similar nervousness. The question whether the position of a door, whether open or closed, could be told at a distance was variously answered. Ninety-six could tell and twenty-six could not. Of the ninety-six, forty-one could see well enough to make sight the chief guide in the process; ten judged mainly by the sound, while forty-five have a "facial perception" more or less strong. This enters in a vague way into their dreams, but seldom plays an important rôle.

The stories attributing to the blind rather wonderful notions of color have, on careful examination, been readily explained by natural means; the use of words referring to color is often merely verbal (of this Laura Bridgman furnishes many excellent examples),

* I have further tested this order of importance of the senses by asking how the blind recognized in their dreams where they were; and the answer given to me was that they knew by the information obtained through their predominant sense, giving me the same order as before; many, also, mentioned a vague feeling of strangeness which they could not analyze.

the knowledge of the color of certain definite objects is obtained by inference, based upon texture, appropriateness, and similar characteristics. Attention has recently been given to the analogies between color and sound. Mr. Galton has recorded many cases in which the sounds of the vowels, of words, of musical notes, and the like, immediately summon to the mental eye an appropriate color, often with a peculiar outline and shading. One person could actually "read sounds" out of a wall-paper pattern, or write the sounds in the name "Francis Galton" in colors. It seemed possible that the blind might obtain or receive some dim notions of color by a similar process, and Doctor Kitto and the blind teacher, Friedrich Scherer, mention that such is the case, though to a very slight extent.* The latter calls musical instruments the bridge across which color comes to him. (He became blind when two years old.) The flute is his symbol of green, the swelling organ tones of blue. The trumpet is red, the hunter's horn dark green and violet, a general confusion of tones is gray, while pink and crimson are associated with the feeling of velvet. In my list occurs the record of a young man twenty years old, and blind for three years. He saw colors on hearing certain sounds soon after his blindness, and claims that he is thus able to keep alive his notions of color. To him an alto voice is gray; a soprano, white; a tenor, yellow; a bass, black. While I was speaking to him he saw a dark ground. A few words are also colored to him; the sound of "Smith" seems yellow. These analogies, however, are fanciful and rare. They belong to an, as yet, little-explored region of mental phenomena, and one can do scarcely more than record their existence.

Let me, finally, give some examples from the collection of dreams and parts of dreams which these blind people have put at my command. Many are such as we ourselves commonly experience, and many exhibit the peculiarities which have been noticed above. A boy with more than usual imagination dreamed that he was in a

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* The fact that many of those who have never seen lack all clear ideas as to the nature of vision is clearly made out. This "blind-mindedness" many try to conceal, but a careful questioning usually reveals some erroneous notions, especially amongst those not naturally bright. I have asked the congenitally, or early, blind whether they could easily understand why the sighted could not see both sides of a thing at once, and why things should seem smaller as we recede from them. Of forty-seven, sixteen confessed to a more or less serious difficulty. One boy thought we might look at one side of an object with one eye and at the other with the other. The decrease in size of the image is more readily understood, it being always compared to the fading of the sound at a distance.

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